aliquot of the supernatant is evaporated overnight, and then mixed with scintillation cocktail for determination of [^{14}C]2-DG with a liquid scintillation counter. The rate of glucose uptake in the muscle, adipose tissue and liver is calculated according to Kraegen's method (Kraegen *et al.*, 1982).

EXAMPLE 12

MONITORING OF FOOD CONSUMPTION

Animals were individually housed in a specially designed Metabolic Cage (Nalge Nunc International, Rochester, NY), which has a food chamber that only permits the insertion of the head. The cage also has a deck to collect spilled food pellets without contamination. Food intake was determined by measuring the difference between the pre-weighed standard chow and the weight of chow and spill every 24 hours.

During 12-day observation in *ob/ob* mice, the mean daily food intake of vehicle group and 150 mg/kg extract-treated group were 4.7 ± 0.1 g and 3.0 ± 0.1 g, respectively. There was a significant difference in the mean daily food intake between the vehicle group and 150 mg/kg extract-treated group ($P < 0.01$).

EXAMPLE 13

BODY WEIGHT

The average body weight of adult *ob/ob* or *db/db* mice is almost twice that of their lean littermates. Animals were treated with *Panax ginseng* berry extract, *Panax quinquefolius* berry extract, ginsenoside Re, or a polysaccharide fraction from *Panax quinquefolius* and the body weights were determined.

Panax ginseng **berry extract**

FIG. 16A shows the effects of *Panax ginseng* berry extract on body weight changes in *ob/ob* mice. The body weight of animals in the vehicle-treated group showed a tendency to increase from Day 0 to Day 12. During a 12-day treatment with extract at 50 mg/kg, body weight increase ceased. However, after a 12-day treatment with extract

at 150 mg/kg, body weight reduced significantly from 51.7 ± 1.9 g on Day 0, 48.3 ± 1.5 g on Day 5, to 45.7± 1.2 on Day 12 ($P < 0.05$ and $P < 0.01$ compared to Day 5 and Day 12 vehicle-treated *ob/ob* mice, respectively). Following the cessation of treatment, *ob/ob* mice gradually regained weight, and their body weight approached that of vehicle treated *ob/ob* mice after 22 days (FIG. 16B).

The body weight of lean mice in vehicle-treated group also showed a tendency to increase from 27.1 ± 1.2 g on Day 0, 27.8 ± 1.9 g on Day 5, to 28.9 ± 1.0 g on Day 12. However, during a 12-day treatment with extract at 150 mg/kg, body weight increase in lean mice ceased, i.e., 26.5 ± 1.5 g on Day 0, 26.9 ± 1.4 g on Day 5, and 26.5 ± 1.0 g on Day 12.

Another diabetic model (*db/db*) also was examined for anti-obesity effects of *Panax ginseng* berry extract. After the extract 150 mg/kg treatment, there were significant body weight reductions in both *db/db* mice (FIG. 17) and their lean littermates (FIG. 18). After 5 and 12 days of extract treatment, body weight in *db/db* mice reduced from 51.0 ± 1.9 g on Day 0, to 46.6 ± 1.7 g on Day 5, and to 45.2 ± 1.4 g on Day 12 ($P < 0.05$ and $P < 0.01$ compared to Day 0, respectively). Similar decreases in body weight were observed in lean mice treated with the extract (from 30.9 ± 0.8 g on Day 0, to 28.2 ± 0.7 g on Day 5, to 27.4 ± 0.7 g on Day 12; both $P < 0.01$ compared to Day 0, respectively).

***Panax quinquefolius* berry extract**

As shown in FIG. 19, the body weight of vehicle-treated *ob/ob* mice had a tendency to increase from Day 0 to Day 12 (58.9 ± 0.7 g on Day 0, to 59.3 ± 0.6 g on Day 5, and to 61.0 ± 0.8 g on Day 12). *Panax quinquefolius* ginseng berry extract 150 mg/kg significantly decreased body weight in these obese mice. After 5 and 12 days treatment with extract, body weight reduced from 59.2 ± 0.6 g on Day 0, to 56.7 ± 0.5 g on Day 5, and to 55.0 ± 0.7 g on Day 12 (both $P < 0.01$ compared to Day 0).

Ginsenoside Re

In contrast to both anti-diabetic and anti-obese effects of *Panax ginseng* berry, ginsenoside Re did not result in a reduction in body weight. After 12-day treatment with ginsenoside Re 20 mg/kg, body weight did not change significantly in *ob/ob* mice. Body weight in ginsenoside Re 20 mg/kg group was 53.1 ± 1.4 g on Day 0, 52.9 ± 1.5 g on Day 5, and 54.7 ± 1.7 on Day 12.

***Panax quinquefolius* polysaccharide fraction**

As shown in FIG. 20, body weight of *ob/ob* mice in the vehicle-treated group had a tendency to increase from Day 0 to Day 10. This tendency of body weight increase was not affected by 150 mg/kg or 50 mg/kg polysaccharides administration. However, in 30 days observation, body weight changes were not affected by polysaccharides treatment (FIG. 21).

Thus, similar to ginsenoside Re, polysaccharide fractions of the berry extract only exhibited significant anti-hyperglycemic effects. Thus, this data indicates that the anti-hyperglycemic effects of ginsenoside Re and polysaccharide fractions of berry extracts are independent of body weight changes. Yet further, this data suggests that other constituents in the berry extract have distinct pharmacological mechanisms that affect energy metabolism.

Also, the above data indicate that the ginseng berry extracts clearly are anti-hyperglycemic and anti-obesity agents.

EXAMPLE 14

BODY TEMPERATURE AND ENERGY EXPENDITURE

Mice body temperature was measured with a thermocouple probe (Physitemp, Clifton, NJ). On Day 0, Day 5 and Day 12 at 3:00PM, the thermocouple probe was inserted approximately 1 cm into the rectum to obtain body temperature.